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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,869	12/20/2001	Kenichi Ishida	107101-00038	6259

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ARENT FOX KINTNER PLOTKIN & KAHN, PLLC
Suite 400
1050 Connecticut Avenue, N.W.
Washington, DC 20036-5339

EXAMINER
DOLE, TIMOTHY J

ART UNIT	PAPER NUMBER
2858	

DATE MAILED: 05/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/022,869	Applicant(s) ISHIDA ET AL.	
	Examiner Timothy J. Dole	Art Unit 2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13-16* is/are allowed.

6)☒ Claim(s) *1-5,8-12 and 17-19* is/are rejected.

7)☒ Claim(s) *6,7 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: "9" should be "90" on page 12, line 26; "gait" should be "gate" on page 14, line 14; and multiple punctuation errors on page 15, line 4.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-5, 8-12 and 17-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Noel.

Referring to claims 1 and 9, Noel discloses a system for detecting misfire for an internal combustion engine having an ignition plug (fig. 1 (22)), installed to face into a combustion chamber (fig. 1 (13)) of a cylinder of the engine and connected to an ignition coil (fig. 1 (14)), which produces spark discharge when supplied with discharge current from the ignition coil to ignite air-fuel mixture in the combustion chamber; comprising: a current detection circuit (fig. 1 (28)) which detects ionization current, that flows following the discharge current, during a period; a misfire detector (fig. 1 (44)) which detects occurrence of misfire of the engine based on the detected current; and a

processing delay circuit (figs. 2A and 2B) which inputs at least one of the discharge current and the ionization current (fig. 1 (I_{ION})) and based on the inputted current, delays starting of the period by a time point which is not earlier than termination of the discharge current (figs. 3 A-E).

Referring to claims 2 and 10, Noel discloses the system as claimed wherein the processing delay circuit includes: a comparator (fig. 2A (70)) which inputs the current to compare with a reference value (fig. 2A (Vref)) and produces an output (fig. 2A (pre-ignition signal)) indicative of at least starting of the period, and a capacitor (fig. 2B (76)) provided before the comparator which delays inputting of the current to the comparator such that the starting of the period is delayed by the time.

Referring to claims 3 and 11, Noel discloses the system as claimed wherein the processing delay circuit includes: a comparator (fig. 2A (70)) which inputs the current to compare with a reference value (fig. 2A (Vref)) and produces an output (fig. 2A (pre-ignition signal)) indicative of at least starting of the period, and a reference value supply circuit (fig. 2A (Vref)) which varies the reference value to delay producing of the output of the comparator such that the starting of the period is delayed by the time (column 5, lines 17-19) . It should be noted that Vref is a predetermined value, which implies that it is a value that can be set or changed as deemed necessary for controlling the delay time.

Referring to claim 4, Noel discloses the system as claimed wherein the comparator inputs the ionization current and produces the output indicative of the starting and ending of the period (column 5, lines 12-22).

Referring to claim 5, Noel discloses the system as claimed, further including: a comparator (fig. 2A (70)) which inputs the ionization current to be compared with a reference value and produces the output indicative of the starting and ending of the period column 5, lines 12-22).

Referring to claims 8 and 12, Noel discloses the system as claimed wherein the current detection circuit includes an integration capacitor (fig. 2B (76)) to be charged by the ionization current (column 5, lines 23-34), and the misfire detector detects the occurrence of misfire of the engine based on an output of the integration capacitor (column 5, lines 12-22).

Referring to claim 17, Noel discloses a method of detecting misfire for an internal combustion engine having an ignition plug, installed to face into a combustion chamber of a cylinder of the engine and connected to an ignition coil, which produces spark discharge when supplied with discharge current from the ignition coil to ignite air-fuel mixture in the combustion chamber (column 2, line 60 – column 3, line 4); comprising the steps of: (a) detecting ionization current, that flows following the discharge current, during a period (column 6, lines 11-24); (b) detecting occurrence of misfire of the engine based on the detected current (column 6, lines 24-56 and column 5, lines 19-22); and (c) inputting at least one of the discharge current and the ionization current and based on the inputted current, delaying starting of the period by a time point which is not earlier than termination of the discharge current (column 6, lines 11-24).

Referring to claim 18, Noel discloses the method as claimed wherein the step (c) inputs the ionization current and delays the period by the time since the ionization current begins to flow (column 6, lines 11-24).

Referring to claim 19, Noel discloses the method as claimed wherein the step (c) determines the period based on flow of the ionization current (column 6, lines 11-24).

Allowable Subject Matter

4. Claims 6, 7 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. Claims 13-16 are allowed.

6. The following is a statement of reasons for the indication of allowable subject matter: the claims are patentable over the prior art because of the inclusion of the claim limitations: a processing delay circuit which inputs the discharge current and delays starting of the period by a time after the discharge current ceases to flow.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to show the state of the art with respect to using ionization current to detect misfire.

USPN 6,483,311 to Ketterer et al.: This patent shows an apparatus using an ionic current sensor, an integrator and a comparator for detecting misfire.

USPN 5,896,842 to Abusamra: This patent shows an apparatus using an integrator and multiple timing events for detecting misfire.

USPN 5,777,216 to Van Duyne et al.: This patent shows an apparatus using an ionization detection circuit, and multiple processing components for detecting misfire.

USPN 5,534,781 to Lee et al.: This patent shows an apparatus using an ionization sensor and an integrator for detecting misfire.

USPN 5,396,176 to Ishii et al.: This patent shows an apparatus using multiple samplings of ionic current, and an integrator for detecting misfire.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Dole whose telephone number is 703-305-7396. The examiner can normally be reached on Mon. thru Fri. from 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on 703-308-0750. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TJD
April 29, 2003

N. Le
Supervisory Patent Examiner
Technology Center 2800